in 20 years approximately. Birds taken in mist-nets or shot were immediately dissected, and the contents recovered from the crop and stomachs, were sun-dried. Analysis of the contents of the two species is given below in Table Nos. I & II.

From the above analysis, it appears that bulk of the food of the above two species of munias consists mainly of vegetative matters, (approximately 82 per cent), about 46 per cent consist of paddy and 36 per cent seeds of bamboo and other weed grasses. The remaining 17 per cent have been found to be grit and about one per cent only of animal matter.

The bayas and munias that concentrated in large numbers in a small area of one square kilometre approximately in Rani where this study was made, was estimated to have a population of 1000+ of each species of munias. It was observed that they congregated in large numbers on the nursery of paddy and caused a considerable damage to the paddy cultivation. The local cultivators drive away the birds from such affected nurseries and mature crop employing boys to pelt stones and beat drums. From the analysis of their crop and stomach-contents, it is evident that their first choice as food is grains of paddy.

It has been observed that the munias made 20 trips on average during the whole day from their roost of sugarcane and bamboo thickets to the nursery and standing crop of paddy. Each bird consumed about five grams of paddy in a day. When a flock of 2000+ munias were operating in an area of one square kilometre, the average loss as estimated was nearly five kilogrammes per day per species. This loss is quite substantial to the cultivators.

In conclusion it may be stated that both species, the Blackheaded Munia and the Spotted Munia are definitely harmful to cultivation and could be categorised as serious cereal pests in Western Assam.

Zoological Survey of India,
Indian Museum,
Calcutta 16,
July 13, 1977.

B. C. SAHA
A. K. MUKHERJEE

References

Ali, S. and Ripley, S. D. (1974): Handbook of the birds of India and Pakistan, Vol. 10, Oxford University Press, Bombay.

Mason, C. W. and Maxwell-Lefroy, H. (1912): The food of birds in India. *Mem. Dep. Agric. India.* (Ent. Ser.), *3*: 123-124.

Whistler, H. (1963): Popular Handbook of Indian birds, 3rd edition (reprinted). Oliver & Boyd, Edinburgh and London.

13. NOTE ON THE STATUS OF THE GIR CROCODILES

(*With a plate*)

The superintendent of Gir National Park, Sanat Chavan provided transport for me to visit Hiran Lake the morning after my arrival at Sasan Gir on 28 May 1975. Jeevan Lal, a maldhari (herder) who had assisted Paul Joslin's lion study, was my guide for the next few days. I spent the first day making a round of Hiran Lake, the reservoir formed by the Kamleshwar

Dam within the Park. Being a drought year the reservoir was down to two long channels about 30 metres wide and rarely more than 2 metres deep.

We saw 20 crocodiles (*C. palustris*) in the water during the day, none basking, ranging from last year hatchlings to adults upwards of 3 metres. The most interesting feature of the habitat was the presence of 16 tunnels in one high embankment, dug by the mugger apparently against the eventuality of the lake completely drying up. The tunnels had flattened oval entrances and averaged 80 cm in width and went in 4 to 5 metres. Using a torch we found that there was a crocodile in nearly every tunnel. In the vicinity of the tunnels Jeevan located a nest of crocodile eggs in the course gravelly soil *c* 3 m above the water line, by noting the disturbed nature of the nest site. Searching the vicinity we located another nest. Later, joined by Mr. Chavan, the eggs were carefully collected and packed in hatching boxes using the original nest soil. Each nest contained 25 eggs, indicating smaller females of 2 to $2\frac{1}{2}$ metres length

Just across a thin channel from the nest sites I stretched down over a steep ledge to peer into a tunnel with my torch. There was no need for a light however, an adult mugger's face peered at me from little more than an arm's length away. The crocodile made no movement and was in that position several hours later. We assumed this was perhaps one of the females whose nest had been found.

That night we made a complete circuit of the two channels that make up the Hiran Lake at this time of year. Using a powerful torch we counted the red glowing eyes of 51 crocodiles, estimated that we missed at least 25 for a total of 76 mugger of all sizes. This is the largest single concentration of mugger we know of in India. We spent almost the whole night at the dam and were treated to a spectacular lion chorus, something the unfortunate tourists at the Sasan rest house would never hear.

30th May: Jeevan Lal and I spent the day examining the Lake and parts of the Hiran River, below the dam. There was evidence of a few crocodiles in this densely wooded swampy area. We were told by one of the old Forest Guards that during fishing activities by the Fisheries Department, a number of crocodiles came down to the shelter of this swamp. Compared to the reservoir area, which is barren except for a few old tree stumps, this is ideal "alternate habitat' for juvenile crocodiles. We randomly examined crocodile feces and found remains of fish, cattle egret and watersnake. We spent the hot part of the day at the "ness" of a very hospitable family of Maldharis camped near the lake. They surround their camp with a large pile of thorny branches similar to the "boma" in parts of Africa. We had a long talk about crocodiles and they told us of the "jhurd", a tentacled beast that lived in deep water which pulled animals and men under water. The skin and bones of the unfortunate victim would be found several days later. A note on this "beast" is in *JBHNS* (*27*:175).

Later in the day we found a crocodile skull and were told of a group of "mugri puckard wala" who came "a few" years ago. 5 or 6 men with women and children camped at the lake and, using hooks baited with goat guts tied to heavy line floated with peacock feathers, caught about 15 crocodiles. The crocodiles were killed with an axe, the skin, fat and some parts removed. The hunters moved on after a few weeks. We later watched two crocodiles "trap" fish near the shore and one caught a large fish and ate it.

June Ist: we spent the day touring the National Park to see other crocodile habitat in the now mostly dry Hiran River and tributaries.

We passed through the villages of Seerwan and Madhupar of the "Sidhi-lok", Africans said to have been brought as warriors (slaves) by some of the old Rajas. They are practicing Moslems and now speak Gujarati. At Bonaj, a temple in the Park, we were told there are two crocodiles in the pool there and there we saw a tunnel in the embankment with fresh marks. We also visited Mugri Guna where there were several crocodile tunnels, one obviously occupied. These tunnels were generally dug under the shelter and support of the roots of a "jamun" tree (*Eugenia jambolana*). Sodia nullah, Pilipat Stream and Singoda Nadi are other spots which retain water in the dry season and have a few resident crocodiles. The Maharaj at Bonaj said that a crocodile was dug out of tunnel two years back at Mugri Guna by some "jungle people" not local. The crocodiles in these streams "gunas" must nest in the water—accumulated piles of sand. These areas are very disturbed by the daily arrival of hundreds to thousands of cattle. In the evening I caught a bat downed by crows. It turned out to be a Bearded Sheath-tailed Bat.

4th to 6th June was spent in the hospitality of Jamsahib of Jamnagar in the Barda Hills about 40 km from Porbandar. This is an area of about 200 sq. km of scrub jungle with hills up to 2,000 ft. These little hills and those in the Gir area are just about the only water shed/catchment areas left in the desert—like Saurashtra. There are numerous small and large tanks in the hills, several have small crocodile populations. Five of the larger minor reservoirs are Rana Sagar, Gulab Sagar, Suth Sagar, Phodara Sagar, Khambara Sagar.

South of Porbandar lives a group of about 4,000 people known as "Deemar." These are part time cultivators, hunters and fishermen. One of these, Jumma Ismail, was camped with his family at Khambara Sagar so I spent the night there talking and watching the fishing. Jumuna said that at least 50 crocodiles had left this reservoir since they started fishing, as the water went down. Now it was mostly a shallow lake with one area of deep water up to about 4 m. The migrant crocodiles were apparently headed toward a larger tank about 8 km away. Since this was the worst drought in 40 years, this years overland crocodile activity was unusual. Local hunter/gatherers, the Wagris, (taught by professional crocodile hunters said to travel around from U.P.) now know the value of crocodiles skin, fat and odd parts for "medicine." It is doubtful said Jumma, if any of the crocodiles made it to the next reservoir as he saw the Wagri follow up and kill a number of them. It was useless to try to spot the crocodiles at night he said, they know about night hunting and disappear. We saw crocodiles the next day only. Early in the morning we made a round of the lake and found the tracks of a sub-adult crocodile leading up into the scrub jungle hills; naturally we followed it. An expert shikari, Mesur, was along so we had little difficulty locating the slight scuff marks on the scorched packed soil. The crocodile mostly followed cow paths but also climbed up steep rocky faces with lizard efficiency. We finally found the animal about $2\frac{1}{2}$ km from the reservoir, half hidden under a large over-hanging rock which sheltered it for the day. It had about 6 km to go to reach Phodara Sagar and cow-herders were sure to spot it. With some difficulty we caught the metre and a half animal, tied its jaws with a binocular strap and took turns carrying it back. Later we released this and a juvenile Jumma had caught in his net into a reservoir not likely to dry out. At Khambara during the day we saw several juvenile crocodiles up to 60 cm long and one adult about 2 m. Jumma said the same U.P. catchers who had visited Gir a

Hiran Lake, Gir in drought season. Nearly every crocodile tunnel found here contained a crocodile. Two nests were located very close to this site.